

REMARKS

After entry of the instant amendment, Claims 1-8, 11, 13-15, 21-23, 26-32, 35, 36, 40, 41, 44, 50-52, 60, 64, 65 and 68-83 are pending and under consideration. A marked up version of Amended Claims 2-8, 11, 13, 14, 21, 26-32, 35, 36, 40, 44, 50 and 52 is attached hereto as Exhibit A. A clean copy of pending Claims 1-8, 11, 13-15, 21-23, 26-32, 35, 36, 40, 41, 44, 50-52, 60, 64, 65 and 68-83 is attached hereto as Exhibit B.

Applicants expressly reserve the right to pursue any canceled subject matter in one or more related, continuation, divisional or continuation-in-part application(s).

I. THE AMENDMENT OF THE CLAIMS

Claims 2-8, 11, 13, 14, 21, 40, 44, 50 and 52 have been amended to alter their dependencies from Claim 1, 58, 59 or 60 to depend only from allowed Claims 1 or 60. Support for amended Claims 2-8, 11, 13, 14, 21, 40, 44, 50 and 52 can be found in the specification and in Claims 2-8, 11, 13, 14, 21, 40, 44, 50 and 52, as originally filed.

Claims 26-32, 35 and 36 have been amended to alter their dependencies from Claim 23, 62, 63 or 64 to depend only from allowed Claims 23 or 64. Further, Claim 36 has been amended to remove the limitation of moderate or high stringency. Support for amended Claims 26-32, 35 and 36 can be found in the specification and in Claims 26-32, 35 and 36, as originally filed.

Support for new Claim 68 can be found in the specification at, for example, page 11, line 29 through page 12, line 14 and at page 14, lines 24-27. Support for new Claim 69 can be found in the specification at, for example, page 11, line 29 through page 12, line 14, at page 14, lines 24-27 and at page 27, lines 30-31. Support for new Claim 70 can be found in the specification at, for example, page 11, line 29 through page 12, line 14, at page 14, lines 24-27 and at page 13, lines 8-19 and in Claim 2, as originally filed. Support for new Claim 71 can be found in the specification at, for example, page 11, line 29 through page 12, line 14, at page 14, lines 24-27 and at page 12, lines 21-24. Support for new Claim 72 can be found in the specification at, for example, page 11, line 29 through page 12, line 14, at page 14, lines 24-27 and at page 12, lines 29-31.

Support for new Claim 73 can be found in the specification at, for example, page 11, line 29 through page 12, line 14, page 12, lines 21-24, 29-31, page 14, lines 24-27 and

page 27, lines 30-31. Support for new Claim 74 can be found in the specification at, for example, page 11, line 29 through page 12, line 14, page 12, lines 21-24, 29-31, page 13, lines 8-19 and page 14, lines 24-27 and in Claim 2, as originally filed. Support for new Claim 75 can be found in the specification at, for example, page 11, line 29 through page 12, line 14, page 12, lines 21-24, page 13, lines 8-19, page 14, lines 24-27 and page 27, lines 30-31 and in Claim 2, as originally filed. Support for new Claim 76 can be found in the specification at, for example, page 11, line 29 through page 12, line 14, page 12, lines 29-31, page 13, lines 8-19, page 14, lines 24-27 and page 27, lines 30-31 and in Claim 2, as originally filed. Support for new Claim 77 can be found in the specification at, for example, page 11, line 29 through page 12, line 14, page 12, lines 21-24, 29-31, page 13, lines 8-19, page 14, lines 24-27 and page 27, lines 25-29 and in Claim 2, as originally filed.

Support for new Claim 78 can be found in the specification as noted above for new Claims 68-77, and at, for example, page 16, line 32 through page 17, line 5, at page 23, lines 11-14 and in Claim 5 as originally filed. Support for new Claim 79 can be found in the specification as noted above for new Claims 68-77, and at, for example, page 31, lines 16-21 and in Claim 11 as originally filed. Support for new Claim 80 can be found in the specification as noted above for new Claims 68-77, and at, for example, page 23, lines 11-19 and in Claim 14 as originally filed. Support for new Claim 81 can be found in the specification as noted above for new Claims 68-77, and at, for example, page 30, lines 21-24 and in Claim 21 as originally filed. Support for new Claim 82 can be found in the specification as noted above for new Claims 68-77 and in Claim 23 as originally filed. Support for new Claim 83 can be found in the specification as noted above for new Claims 68-77, and at, for example, page 32, lines 5-10 and in Claim 26 as originally filed.

As the amendments to the claims are fully supported by the specification and claims as originally filed, they do not constitute new matter. Entry thereof is therefore respectfully requested.

II. ALLOWABLE SUBJECT MATTER

Applicants note with appreciation that the Examiner indicates that original Claims 1, 23, 60 and 64 are allowable. All Claims have been amended to depend from either Claim 1 or 60, or from Claim 23 or 64. Accordingly, dependent Claims 2-8, 11, 13-15, 21, 22, 26-32,

35, 36, 40, 41, 44, 50-52, and 65 are patentable for at least the same reasons as allowed, independent Claims 1, 23, 60 and 64.

II. THE REJECTIONS UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

A. The Rejections of Claims 10, 34 and 67

Claims 10, 34 and 67 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. The PTO maintains that the term “high density or high molecular weight” renders the claims indefinite. Applicants respectfully submit that the cancellation of Claims 10, 34 and 67 renders the rejection moot.

In view of the foregoing, Applicants respectfully request that the rejection of Claims 10, 34 and 67 under 35 U.S.C. § 112, second paragraph, be withdrawn.

B. The Rejections of Claims 24, 25 and 36

Claims 24, 25 and 36 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. The PTO maintains that the term “high stringency or low stringency or moderate stringency” renders the claims indefinite. Applicants respectfully submit that the cancellation of Claims 24 and 25 renders the rejection of these Claims moot. Further, the removal of the “moderate or high stringency” language from Claim 36 renders the rejection of Claim 36 moot.

In view of the foregoing, Applicants respectfully request that the rejection of Claims 24, 25 and 36 under 35 U.S.C. § 112, second paragraph, be withdrawn.

C. The Rejections of Claims 9 and 33

Claims 9 and 33 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly lacking sufficient antecedent basis. The PTO asserts that there is insufficient antecedent basis for the term “glass” in Claims 9 and 33. Applicants respectfully submit that the cancellation of Claims 9 and 33 renders the rejection moot.

In view of the foregoing, Applicants respectfully request that the rejection of Claims 9 and 33 under 35 U.S.C. § 112, second paragraph, be withdrawn.

III. THE REJECTIONS UNDER 35 U.S.C. §§ 102 and 103(a)

A. The Rejections of Claims 2-5, 8, 9, 14, 15, 21, 22, 24, 25, 27-29, 32, 33, 36, 40, 41, 59 and 63

Claims 2-5, 8, 9, 14, 15, 21, 22, 24, 25, 27-29, 32, 33, 36, 40, 41, 59 and 63 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly being obvious over U.S. Patent No. 5,843,767 (“Beattie”). Applicants respectfully submit that the cancellation of Claims 9, 24, 25, 33, 59 and 63 renders the rejection against these Claims moot. Further, Applicants respectfully submit that the amendment of Claims 2-5, 8, 14, 21, 27-29, 32, 36, and 40 to depend only from allowed Claims 1, 23, 60 or 64 renders the rejection against these Claims as well as the rejection of Claims 15, 22 and 41 that depend from Claims 14, 21 and 40, respectively, moot.

In view of the foregoing, Applicants respectfully request withdrawal of the rejection of Claims 2-5, 8, 9, 14, 15, 21, 22, 24, 25, 27-29, 32, 33, 36, 40, 41, 59 and 63 under 35 U.S.C. §§ 102 and 103(a).

B. The Rejections of Claims 3-10, 14, 15, 21, 22, 24, 25, 27-34, 36, 40, 41, 58, 59, 62 and 63

Claims 3-10, 14, 15, 21, 22, 24, 25, 27-34, 36, 40, 41, 58, 59, 62 and 63 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly being obvious over U.S. Patent No. 6,060,240 (“Kamb”). Applicants respectfully submit that the cancellation of Claims 9, 10, 24, 25, 33, 34, 58, 59, 62 and 63 renders the rejection against these Claims moot. Further, Applicants respectfully submit that the amendment of Claims 3-8, 14, 21, 27-32, 36, and 40 to depend only from allowed Claims 1, 23, 60 or 64 renders the rejection against these Claims as well as the rejection of Claims 15, 22 and 41 that depend from Claims 14, 21 and 40, respectively moot.

In view of the foregoing, Applicants respectfully request that the rejection of Claims 3-10, 14, 15, 21, 22, 24, 25, 27-34, 36, 40, 41, 58, 59, 62 and 63 under 35 U.S.C. §§ 102 and 103(a) be withdrawn.

IV. THE REJECTIONS UNDER 35 U.S.C. § 103

Claims 44, 50-52 and 65 are rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Beattie and U.S. Patent No. 5,843,662 (“Dean”). Claims 44, 50-52 and 65-67 are rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Kamb and Dean.

A. The Rejections of Claims 44, 50-52 and 65 Over Beattie and Dean

Applicants respectfully submit that the amendment of Claims 44, 50 and 52 to depend only from allowed Claims 1 or 60 renders the rejection against these Claims as well as the rejection of Claim 51 that depends from Claims 50 and Claim 65 that depends from Claims 50 and 51 moot.

In view of the foregoing, Applicants respectfully request that the rejection of Claims 44, 50-52 and 65 under 35 U.S.C. § 103(a) be withdrawn.

B. The Rejections of Claims 44, 50-52 and 65-67 Over Kamb and Dean

Applicants respectfully submit that the cancellation of Claims 66 and 67 renders the rejection against Claims 66 and 67 moot. Further, Applicants submit that the amendment of Claims 44, 50 and 52 to depend only from allowed Claims 1 or 60 renders the rejection against these Claims as well as the rejection of Claim 51 that depends from Claims 50 and Claim 65 that depends from Claims 50 and 51 moot.

In view of the foregoing, Applicants respectfully request that the rejection of Claims 44, 50-52 and 65-67 under 35 U.S.C. § 103(a) be withdrawn.

CONCLUSION

Applicants submit that Claims 1-8, 11, 13-15, 21-23, 26-32, 35, 36, 40, 41, 44, 50-52, 60, 64, 65 and 68-83 satisfy all of the criteria for patentability and are in condition for allowance. An early indication of the same and passage of Claims 1-8, 11, 13-15, 21-23, 26-32, 35, 36, 40, 41, 44, 50-52, 60, 64, 65 and 68-83 to issuance is therefore kindly solicited.



No fees in addition to the appeal and extension fees are believed due in connection with this response. However, the Commissioner is authorized to charge all required fees, fees under 37 CFR § 1.17 and all required extension of time fees, or credit any overpayment, to Pennie & Edmonds U.S. Deposit Account No. 16-1150.

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Respectfully submitted,

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Enclosure (Exhibits A and B)

EXHIBIT A
MARKED UP VERSION OF AMENDED CLAIMS

2. (Thrice Amended) The flow-through device of Claim [58, 59 or] 60 in which said porous substrate is about 1 mm to 20 mm thick.

3. (Thrice Amended) The flow-through device of Claim 1[, 58 or 59] in which said porous substrate has an average pore size of about 1 μm to about 250 μm .

4. (Thrice Amended) The flow-through device of Claim [58, 59 or] 60 in which said porous substrate has immobilized thereon about 2×10^{-19} to 2×10^{-15} nmol/nm² of said capture polynucleotide.

5. (Twice Amended) The flow-through device of Claim 1[, 58, 59] or 60 in which said capture polynucleotide is covalently attached to the porous substrate.

6. (Twice Amended) The flow-through device of Claim 1[, 58, 59] or 60 in which said capture polynucleotide is covalently attached to the porous substrate *via* a phosphodiester, phosphorothioate or phosphoramidate linkage.

7. (Twice Amended) The flow-through device of Claim 1[, 58, 59] or 60 in which said capture polynucleotide is covalently attached to the porous substrate *via* a carboxamide linkage.

8. (Thrice Amended) The flow-through device of Claim 1[, 58, 59] or 60 in which said capture polynucleotide is covalently attached to the porous substrate *via* a linker.

11. (Thrice Amended) The flow-through device of Claim 1[, 58] or 60 in which said porous substrate has a void volume in the range of about 1 $\mu\text{l}/\text{cm}^2$ to about 100 $\mu\text{l}/\text{cm}^2$.

13. (Thrice Amended) The flow-through device of Claim 1[, 58 or 59] in which the porous substrate has a porosity in the range of about 25 to 80%.

14. (Thrice Amended) The flow-through device of Claim 1[, 58, 59] or 60 in which the capture polynucleotide is covalently immobilized on the porous substrate via its 5'- or 3'-terminal residue.

21. (Thrice Amended) The flow-through device according to Claim 1[, 58, 59] or 60 further comprising a housing in which the three-dimensional porous substrate is disposed.

26. (Thrice Amended) The method of Claim 23[, 62, 63] or 64 in which said target nucleic acid is applied to the flow-through device under conditions wherein it hybridizes with said capture polynucleotide in less than one minute.

27. (Thrice Amended) The method of Claim 23[, 62, 63 or 64] in which said porous substrate of said flow-through device has an average pore size of about 1 μm to about 250 μm .

28. (Thrice Amended) The method of Claim [62, 63 or] 64 in which the density or surface concentration of said capture polynucleotide is about 2×10^{-19} to 2×10^{-15} nmol/nm².

29. (Twice Amended) The method of Claim 23[, 62, 63] or 64 in which said capture polynucleotide is covalently attached to the porous substrate of the flow-through device.

30. (Twice Amended) The method of Claim 23[, 62, 63] or 64 in which said capture polynucleotide is covalently attached to the porous substrate of the flow-through device *via* a phosphodiester, phosphorothioate or phosphoramidate linkage.

31. (Twice Amended) The method of Claim 23[, 62, 63] or 64 in which said capture polynucleotide is covalently attached to the porous substrate of the flow-through device *via* a carboxamide linkage.

32. (Thrice Amended) The method of Claim 23[, 62, 63] or 64 in which said capture polynucleotide is covalently attached to the porous substrate of the flow-through device *via* a linker.

35. (Thrice Amended) The method of Claim 23[, 62, 63] or 64 in which said porous substrate of said flow-through device has a void volume in the range of 0.1 $\mu\text{l}/\text{cm}^2$ to about 100 $\mu\text{l}/\text{cm}^2$.

36. (Thrice Amended) The method of Claim 23[, 62, 63] or 64 which further includes the step of washing said hybridized complex under conditions of moderate or high stringency. *11/15/2002*

40. (Thrice Amended) A method of determining whether a sample contains a target nucleic acid, said method comprising the steps of:

- (a) flowing a sample suspected of containing a target nucleic acid through a flow-through device according to Claim 1[, 58, 59] or 60 under conditions wherein the target nucleic acid and capture polynucleotide hybridize; and
- (b) detecting the presence of hybrids, wherein a positive detection indicates the presence of the target nucleic acid in the sample.

44. (Thrice Amended) A kit for capturing a target nucleic acid of interest from a sample, comprising:

- a) a flow-through device according to Claim 1[, 58, 59] or 60; and
- b) a housing into which the flow-through device can be disposed.

50. (Four Times Amended) A kit for capturing a target nucleic acid from a sample comprising:

- a) a flow-through device according to Claim 1[, 58, 59] or 60; and
- b) a capture polynucleotide capable of being covalently attached to the porous substrate.

52. (Four Times Amended) A kit for capturing a target nucleic acid from a sample comprising:

- a) a flow-through device according to Claim 1[, 58, 59] or 60; and
- b) means for generating a capture polynucleotide which is capable of hybridizing to the target nucleic acid and which is capable of being covalently attached to the porous substrate.